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HUAWEI

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Assignee:
LOGANTREE LP

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United States Patent

Brann

(10) **Number:**   US 6,059,576 C1

(45) **Certificate Issued:**   Mar. 17, 2015

(54) **TRAINING AND SAFETY DEVICE, SYSTEM AND METHOD TO AID IN PROPER MOVEMENT DURING PHYSICAL ACTIVITY**

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A63B 24/00   (2006.01)

(52) **U.S. Cl.**
CPC *A61B 5/1116* (2013.01); *A63B 2220/40* (2013.01); *Y10S 482/901* (2013.01)
USPC **434/247**; 600/595; 482/8; 482/901; 702/101; 601/34

(58) **Field of Classification Search**
None
See application file for complete search history.

(56)   **References Cited**

To view the complete listing of prior art documents cited during the proceeding for Reexamination Control Number 90/013,201, please refer to the USPTO's public Patent Application Information Retrieval (PAIR) system under the Display References tab.

Primary Examiner — Danton DeMille

(57)   **ABSTRACT**

An electronic device, system and method to monitor and train an individual on proper motion during physical movement. The system employs an electronic device which tracks and monitors an individual's motion through the use of an accelerometer capable of measuring parameters associated with the individual's movement. The device also employs a user-programmable microprocessor which receives, interprets, stores and responds to data relating to the movement parameters based on customizable operation parameters, a real-time clock connected to the microprocessor, memory for storing the movement data, a power source, a port for downloading the data from the device to other computation or storage devices contained within the system, and various input and output components. The downloadable, self-contained device can be worn at various positions along the torso or appendages being monitored depending on the specific physical task being performed. The device also detects the speed of movements made while the device is being worn. When a preprogrammed recordable event is recognized, the device records the time and date of the occurrence while providing feedback to the wearer via visual, audible and/or tactile warnings.

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Claim 1

1. A portable, self-contained device for monitoring movement of body parts during physical activity, said device comprising:

a movement sensor capable of measuring data associated with unrestrained movement in any direction and generating signals indicative of said movement;

a power source;

a microprocessor connected to said movement sensor and to said power source, said microprocessor capable of receiving, interpreting, storing and responding to said movement data based on user-defined operational parameters, *detecting a first user-defined event based on the movement data and at least one of the user-defined operational parameters regarding the movement data, and storing first event information related to the detected first user-defined event along with first time stamp information reflecting a time at which the movement data causing the first user-defined event occurred;*

at least one user input connected to said microprocessor for controlling the operation of said device;

a real-time clock connected to said microprocessor;

memory for storing said movement data; and

an output indicator connected to said microprocessor for signaling the occurrence of user-defined events;

wherein said movement sensor measures the angle and velocity of said movement.

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Claim (1)	Huawei Fit
A portable, self-contained device for monitoring movement of body parts during physical activity, said device comprising:	Non-limiting claim preamble. portable, self-contained device for monitoring movement of body parts during physical activity **Motion Detection** Wear your fitness watch properly, and it automatically identifies your movements, including walking and running, and collects your fitness data. Source: Huawei Fit Quick Start Guide, 2016, p 10, see https://consumer.huawei.com/en/support/wearables/fit/ Wear your watch and it will automatically record your fitness data all day. Your watch can automatically record your steps, calories burned, and exercise distance, as well as track your progress of achieving your goals. When a goal is achieved, your watch will vibrate and display an achievement screen. Source: Huawei Fit User Guide, 2016, p 11, see https://consumer.huawei.com/en/support/wearables/fit/

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Claim (1)	Huawei Fit
a movement sensor capable of measuring data associated with unrestrained movement in any direction and generating signals indicative of said movement;	**a movement sensor** It does have a 3-axis accelerometer, 6-axis (gyroscope + accelerometer) sensor, heart rate monitor (PPG), wear sensor (CAP-Sensor), ambient light sensor. Source: https://www.smartwatchspecifications.com/Products/huawei-fit/ In terms of fitness tracking, don't expect anything out of the ordinary from the Fit. There's a 3-axis accelerometer and a six-axis accelerometer and gyrometer motion sensor setup to track steps, measure distance and estimate calories burned. Source: https://www.wareable.com/fitness-trackers/huawei-fit-review **generating signals indicative of said movement** **capable of measuring data associated with unrestrained movement in any direction** There's also a limited degree of motion-control. Now, most of the time the Fit's six-axis motion sensor works to detect active use. When you raise your arm up to look at the watch, it lights up the display (if needed) and activates additional watch-face elements that are normally turned off – at rest, one may display only an hour and minute hand, but raising your wrist causes the Fit to also show a second hand and the date. Source: https://www.phonearena.com/reviews/Huawei-Fit-Review_id4270/page/2

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Claim (1)	Huawei Fit
a power source;	**1.4 Charging the watch** **Charging** Your watch comes with a magnetic charging cradle and USB cable, which can be used with a standard charger (within 5 V/2 A) to charge your watch. 3. It takes approximately 2 hours to fully charge your watch. When your watch is fully charged, **100%** will be displayed on the watch screen. Disconnect your watch from the power adapter once it is fully charged. 100% ← a power source Source: Huawei Fit User Guide, 2016, pp 2-3, see https://consumer.huawei.com/en/support/wearables/fit/ **Battery** **Battery Capacity** 80 mAh 6 days of battery life ← a power source Source: https://www.smartwatchspecifications.com/Products/huawei-fit//

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Claim (1)	Huawei Fit
a microprocessor connected to said movement sensor and to said power source, said microprocessor capable of receiving, interpreting, storing and responding to said movement data based on user-defined operational parameters,	**Huawei Fit - Specs** **Platform** OS Platform — Proprietary OS **Processor** CPU — - a microprocessor connected to said power source, **Battery** Battery Capacity — 80 mAh 6 days of battery life Source: https://www.smartwatchspecifications.com/Products/huawei-fit//

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Claim (1)	Huawei Fit
a microprocessor connected to said movement sensor and to said power source, said microprocessor capable of receiving, interpreting, storing and responding to said movement data based on user-defined operational parameters,	a microprocessor connected to said movement sensor, In terms of fitness tracking, don't expect anything out of the ordinary from the Fit. There's a 3-axis accelerometer and a six-axis accelerometer and gyrometer motion sensor setup to track steps, measure distance and estimate calories burned. Unfortunately, it was often quite a way out from the fitness trackers we paired it up against. We always allow for some degree of difference in step count as all companies use their own algorithms to crunch the data, but it was noticeably higher on the Fit. said microprocessor capable of receiving, interpreting said movement data What's more disappointing is the sports tracking. There's the option to track running, cycling, walking, treadmill and swimming but it's mainly optimised for running. There's no GPS on board here so you're relying on the other motion sensors to record the data or your smartphone and that's a problem. On several Source: https://www.wareable.com/fitness-trackers/huawei-fit-review

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Claim (1)	Huawei Fit
a microprocessor connected to said movement sensor and to said power source, said microprocessor capable of receiving, interpreting, storing and responding to said movement data based on user-defined operational parameters,	

2.3.2 Viewing exercise results on the watch

When you have finished exercising, swipe on your watch screen to view your exercise result.

Result
🏃 7500
🛣 5.21
⏱ 35:42

said microprocessor capable of storing said movement data

Source: Huawei Fit User Guide, 2016, p 180, see
https://consumer.huawei.com/en/support/wearables/fit/

based on user-defined operational parameters

Huawei gives users several ways to measure their activity and achieve health goals with the Fit. One of the most basic tools is the wearable's step counter, plotting your progress towards set goals (the app recommends 10,000 a day, though you're free to adjust that target). An easy-to-view dial readout gives you a glanceable update on your daily progress.

Source: https://www.phonearena.com/reviews/Huawei-Fit-Review_id4270/page/2

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Claim (1)	Huawei Fit
a microprocessor connected to said movement sensor and to said power source, said microprocessor capable of receiving, interpreting, storing and responding to said movement data based on user-defined operational parameters,	based on user-defined operational parameters Comment: Screenshot of the goals set for the Huawei Watch

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Claim (1)	Huawei Fit
detecting a first user-defined event based on the movement data and at least one of the user-defined operational parameters regarding the movement data,	*detecting a first user-defined event based on the movement data and at least one of the user-defined operational parameters regarding the movement data* Comment: Screenshot of the Huawei Fit goal notification from video file 20201208_161302.

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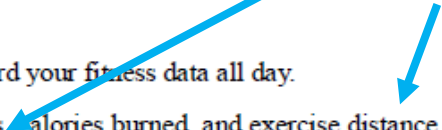| Claim (1)	Huawei Fit
and storing first event information related to the detected first user-defined event along with first time stamp information reflecting a time at which the movement data causing the first user-defined event occurred;	 Source: https://awesomeopensource.com/project/aricooperdavis/Huawei-TCX-Converter

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Claim (1)	Huawei Fit
at least one user input connected to said microprocessor for controlling the operation of said device;	**1.7 Gestures** You can operate your watch by touching and swiping the screen. *at least one user input connected to said microprocessor for controlling the operation of said device;* | Gesture	Description
Touch	Select and confirm.
Swipe up	Access the shortcuts menu.
Swipe down	Access the shortcuts menu.
Swipe right	Go back to the previous menu or home screen. | Source: Huawei Fit User Guide, 2016, p 7, see https://consumer.huawei.com/en/support/wearables/fit/

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Claim (1)	Huawei Fit
a real-time clock connected to said microprocessor;	**2.3.2 Viewing exercise results on the watch** When you have finished exercising, swipe on your watch screen to view your exercise result. Result 7500 5.21 35:42 Source: Huawei Fit User Guide, 2016, p 180, see https://consumer.huawei.com/en/support/wearables/fit/ a real-time clock connected to said microprocessor **Alarms** Open the Huawei Wear app, touch **Devices**, select your device, and then touch **Alarm settings** to select and set an alarm. • **Smart alarm**: Turn on the smart alarm switch, set the alarm time, smart wakeup time, and repeat cycle, and then touch ✓. • **Event alarm**: Touch **Add alarm**, set the alarm time, label, and repeat cycle, and then touch ✓. Source: Huawei Fit User Guide, 2016, p 30, see https://consumer.huawei.com/en/support/wearables/fit/

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Claim (1)	Huawei Fit
memory for storing said movement data; and	**Huawei Fit - Specs** **Memory** **Internal Storage** — 16 MB ← memory for storing said movement data **RAM** — 256 KB **Card Slot** — none Source: https://www.smartwatchspecifications.com/Products/huawei-fit/ Wear your watch and it will automatically record your fitness data all day. Your watch can automatically record your steps, calories burned, and exercise distance, as well as track your progress of achieving your goals. When a goal is achieved, your watch will vibrate and display an achievement screen. ← memory for storing said movement data Source: Huawei Fit User Guide, 2016, p 11, see https://consumer.huawei.com/en/support/wearables/fit/

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Claim (1)	Huawei Fit
an output indicator connected to said microprocessor for signaling the occurrence of user-defined events;	

an output indicator connected to said microprocessor for signaling the occurrence of user-defined events

2.1 Recording and sharing your fitness data

Recording your fitness data

Wear your watch and it will automatically record your fitness data all day.

Your watch can automatically record your steps, calories burned, and exercise distance, as well as track your progress of achieving your goals. When a goal is achieved, your watch will vibrate and display an achievement screen.

Source: Huawei Fit User Guide, 2016, p 11, see https://consumer.huawei.com/en/support/wearables/fit/
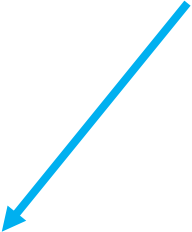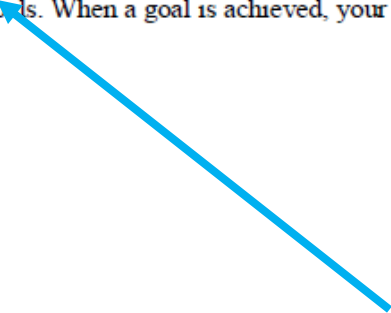
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Claim (1)	Huawei Fit
wherein said movement sensor measures the angle and velocity of said movement.	In terms of fitness tracking, don't expect anything out of the ordinary from the Fit. There's a 3-axis accelerometer and a six-axis accelerometer and gyrometer motion sensor setup to track steps, measure distance and estimate calories burned. Source: https://www.wareable.com/fitness-trackers/huawei-fit-review said movement sensor measures the angle and velocity of said movement. Wear your watch and it will automatically record your fitness data all day. Your watch can automatically record your steps, calories burned, and exercise distance, as well as track your progress of achieving your goals. When a goal is achieved, your watch will vibrate and display an achievement screen. Source: Huawei Fit User Guide, 2016, p 11, see https://consumer.huawei.com/en/support/wearables/fit/

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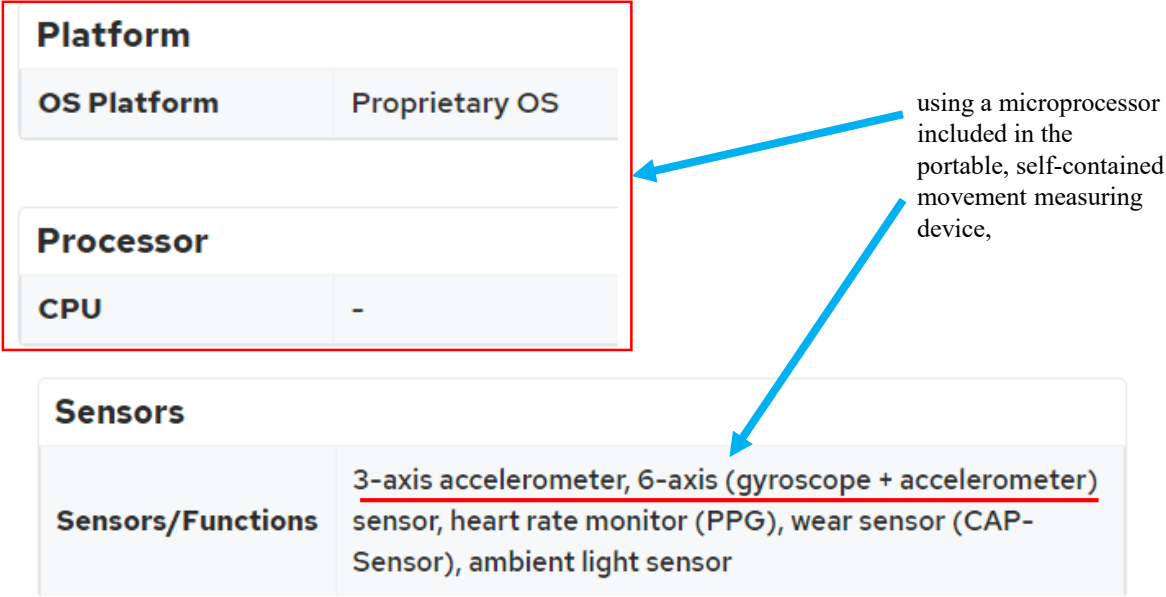| Claim (20)	Huawei Fit
A method to monitor physical movement of a body part comprising the steps of:	**Motion Detection** Wear your fitness watch properly, and it automatically identifies your movements, including walking and running, and collects your fitness data. Source: Huawei Fit Quick Start Guide, 2016, p 10, see https://consumer.huawei.com/en/support/wearables/fit/ A method to monitor physical movement of a body part . Wear your watch and it will automatically record your fitness data all day. Your watch can automatically record your steps, calories burned, and exercise distance, as well as track your progress of achieving your goals. When a goal is achieved, your watch will vibrate and display an achievement screen. Source: Huawei Fit User Guide, 2016, p 11, see https://consumer.huawei.com/en/support/wearables/fit/

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Claim (20)	Huawei Fit
attaching a portable, self-contained movement measuring device to said body part for measuring unrestrained movement in any direction;	attaching a portable, self-contained movement measuring device to said body part. Wear your watch and it will automatically record your fitness data all day. Your watch can automatically record your steps, calories burned, and exercise distance, as well as track your progress of achieving your goals. When a goal is achieved, your watch will vibrate and display an achievement screen. Source: Huawei Fit User Guide, 2016, p 11, see https://consumer.huawei.com/en/support/wearables/fit/ for measuring unrestrained movement in any direction; In terms of fitness tracking, don't expect anything out of the ordinary from the Fit. There's a 3-axis accelerometer and a six-axis accelerometer and gyrometer motion sensor setup to track steps, measure distance and estimate calories burned. Source: https://www.wareable.com/fitness-trackers/huawei-fit-review

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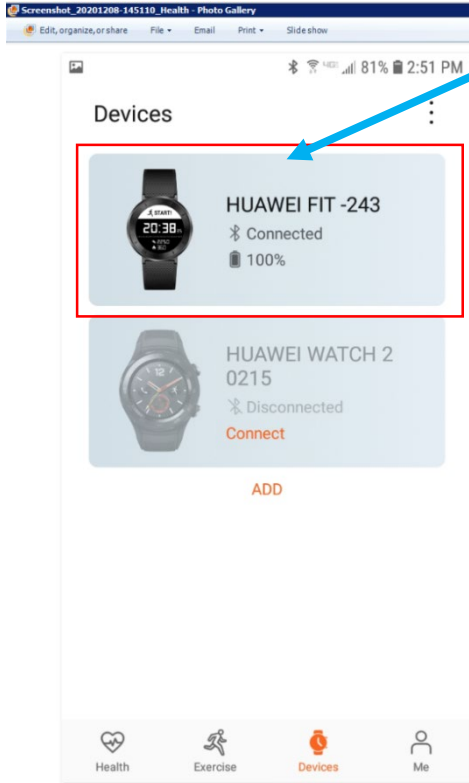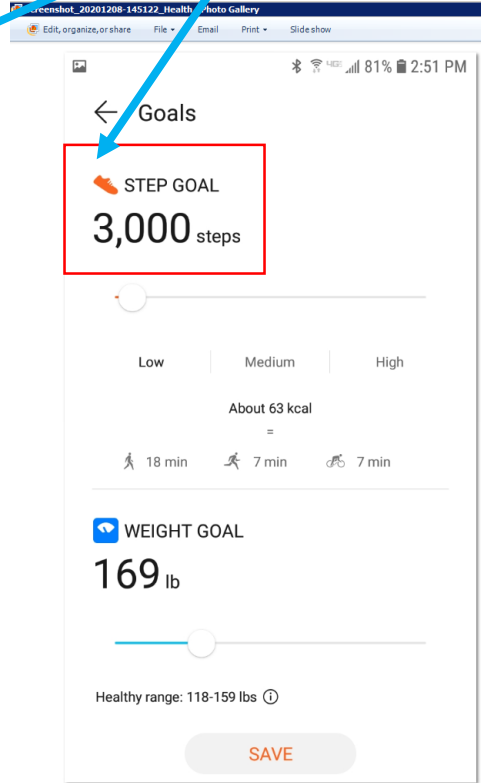| Claim (20)	Huawei Fit
measuring data associated with said physical movement;	In terms of fitness tracking, don't expect anything out of the ordinary from the Fit. There's a 3-axis accelerometer and a six-axis accelerometer and gyrometer motion sensor setup to track steps, measure distance and estimate calories burned. Source: https://www.wareable.com/fitness-trackers/huawei-fit-review measuring data associated with said physical movement;

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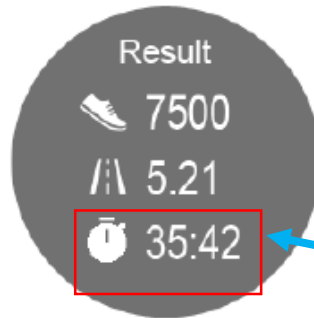| Claim (20)	Huawei Fit
interpreting, using a microprocessor included in the portable, self-contained movement measuring device, said physical movement data based on user-defined operational parameters and a real-time clock; [and]	**Huawei Fit - Specs** **Platform** OS Platform — Proprietary OS **Processor** CPU — - using a microprocessor included in the portable, self-contained movement measuring device, **Sensors** Sensors/Functions — 3-axis accelerometer, 6-axis (gyroscope + accelerometer) sensor, heart rate monitor (PPG), wear sensor (CAP-Sensor), ambient light sensor Source: https://www.smartwatchspecifications.com/Products/huawei-fit//

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Claim (20)	Huawei Fit
interpreting, using a microprocessor included in the portable, self-contained movement measuring device, said physical movement data based on user-defined operational parameters and a real-time clock; [and]	**Motion Detection** Wear your fitness watch properly, and it automatically identifies your movements, including walking and running, and collects your fitness data. Source: Huawei Fit Quick Start Guide, 2016, p 10, see https://consumer.huawei.com/en/support/wearables/fit/ Wear your watch and it will automatically record your fitness data all day. Your watch can automatically record your steps, calories burned, and exercise distance, as well as track your progress of achieving your goals. When a goal is achieved, your watch will vibrate and display an achievement screen. Source: Huawei Fit User Guide, 2016, p 11, see https://consumer.huawei.com/en/support/wearables/fit/ Huawei gives users several ways to measure their activity and achieve health goals with the Fit. One of the most basic tools is the wearable's step counter, plotting your progress towards set goals (the app recommends 10,000 a day, though you're free to adjust that target). An easy-to-view dial readout gives you a glanceable update on your daily progress. Source: https://www.phonearena.com/reviews/Huawei-Fit-Review_id4270/page/2

interpreting, using a microprocessor included in the portable, self-contained movement measuring device, said physical movement data

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Claim (20)	Huawei Fit
interpreting, using a microprocessor included in the portable, self-contained movement measuring device, said physical movement data based on user-defined operational parameters and a real-time clock; [and]	based on user-defined operational parameters Comment: Screenshot of the goals set for the Huawei Watch

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Claim (20)	Huawei Fit
interpreting, using a microprocessor included in the portable, self-contained movement measuring device, said physical movement data based on user-defined operational parameters and a real-time clock; [and]	**2.3.2 Viewing exercise results on the watch** When you have finished exercising, swipe on your watch screen to view your exercise result. Result 🥾 7500 📐 5.21 ⏱ 35:42 Source: Huawei Fit User Guide, 2016, p 180, see https://consumer.huawei.com/en/support/wearables/fit/ and a real-time clock; [and] **Alarms** Open the Huawei Wear app, touch **Devices** 🎙, select your device, and then touch **Alarm settings** to select and set an alarm. • **Smart alarm**: Turn on the smart alarm switch, set the alarm time, smart wakeup time, and repeat cycle, and then touch ✓. • **Event alarm**: Touch **Add alarm**, set the alarm time, label, and repeat cycle, and then touch ✓. Source: Huawei Fit User Guide, 2016, p 30, see https://consumer.huawei.com/en/support/wearables/fit/

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Claim (20)	Huawei Fit
storing said data in memory;	**Huawei Fit - Specs** **Memory** | **Internal Storage**	16 MB
RAM	256 KB
Card Slot	none | storing said data in memory; . Source: https://www.smartwatchspecifications.com/Products/huawei-fit/ **Motion Detection** Wear your fitness watch properly, and it automatically identifies your movements, including walking and running, and collects your fitness data. storing said data in memory; . Source: Huawei Fit Quick Start Guide, 2016, p 10, see https://consumer.huawei.com/en/support/wearables/fit/

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Claim (20)	Huawei Fit
detecting, using the microprocessor, a first user-defined event based on the movement data and at least one of the user-defined operational parameters regarding the movement data; and

detecting, using the microprocessor, a first user-defined event based on the movement data and at least one of the user-defined operational parameters regarding the movement data; and

Comment: Screenshot of the Huawei Fit goal notification from video file 20201208_161302. |

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Claim (20)	Huawei Fit
storing, in said memory, first event information related to the detected first user-defined event along with first time stamp information reflecting a time at which the movement data causing the first user-defined event occurred.	**Huawei TCX Converter** A makeshift python tool that generates TCX files from Huawei HiTrack files. This project is now archived. It has been succedded by Hitrava which performs the same job but better. Users of Huawei Watches/Bands sync their fitness data with the Huawei Health App. It is notoriously difficult to get the data out of this app, but through some cunning you can find `HiTrack` files which seem to contain some run data. This program allows you to take these files and generate `.TCX` files for use in your tracking app of choice (e.g. Strava). The outputted `.TCX` files will contain timestamped GPS, altitude, heart-rate, and cadence data where available. storing, in said memory, first event information. along with first time stamp information the movement data Source: https://awesomeopensource.com/project/aricooperdavis/Huawei-TCX-Converter

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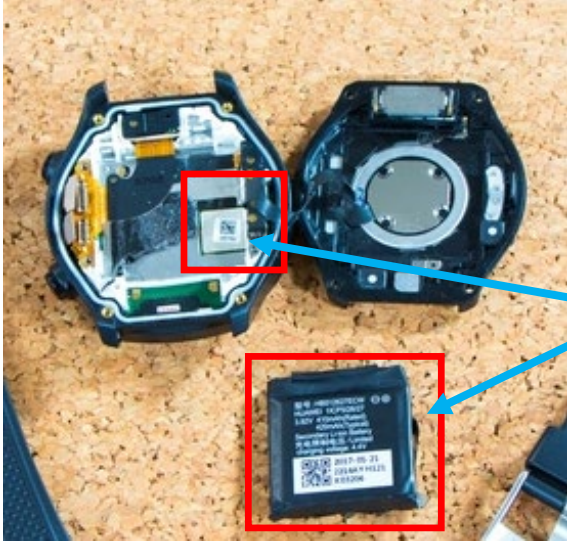| Claim (1)	Huawei Watch 2
A portable, self-contained device for monitoring movement of body parts during physical activity, said device comprising:	Non-limiting claim preamble. portable, self-contained device for monitoring movement of body parts during physical activity Wear your watch and it will automatically record your fitness data all day. Your watch can automatically identify your status, such as walking, running, climbing, and standing. Source: Huawei Watch 2 User Guide, 2019, p29, see https://consumer.huawei.com/us/support/wearables/watch2/ **Health and fitness** Your watch identifies and measures your daily movements intelligently and precisely. You can also enable the **Workout** Source: Huawei Watch 2 Quick Start Guide, 2019, p6, see https://consumer.huawei.com/us/support/wearables/watch2

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Claim (1)	Huawei Watch 2
a movement sensor capable of measuring data associated with unrestrained movement in any direction and generating signals indicative of said movement;	What's really impressive about Watch 2 (Electric Boogaloo) is that it packs in a comprehensive list of sensors, connectivity options and gizmos: GPS, barometer, Wi-Fi, Bluetooth, 4G, an optical heart-rate reader and motion sensing are all aboard. **capable of measuring data associated with unrestrained movement in any direction** **HUAWEI WATCH 2 FULL SPEC** **Display:** 1.2-inch AMOLED, 390x390, 326ppi, Corning Gorilla Glass **Processor:** Qualcomm MSM8909W, 1.1 GHz **Storage:** 4GB **Memory:** 768MB RAM **Cellular option:** LTE **a movement sensor** **Sensors:** Accelerometer, Gyroscope, Barometer, Heart rate sensor(PPG), CAP capacitance sensor, ALS/ambient light sensor, geomagnetic Sensor **Battery** 420mAh (typical value) giving about 2 days typical use; Training mode (GPS & real-time heart rate monitoring on) about 10 hours Source: https://www.t3.com/us/reviews/huawei-watch-2 **Health and fitness** Your watch identifies and measures your daily movements intelligently and precisely. You can also enable the Workout **generating signals indicative of said movement** Source: Huawei Watch 2 Quick Start Guide, 2019, p6, see https://consumer.huawei.com/us/support/wearables/watch2

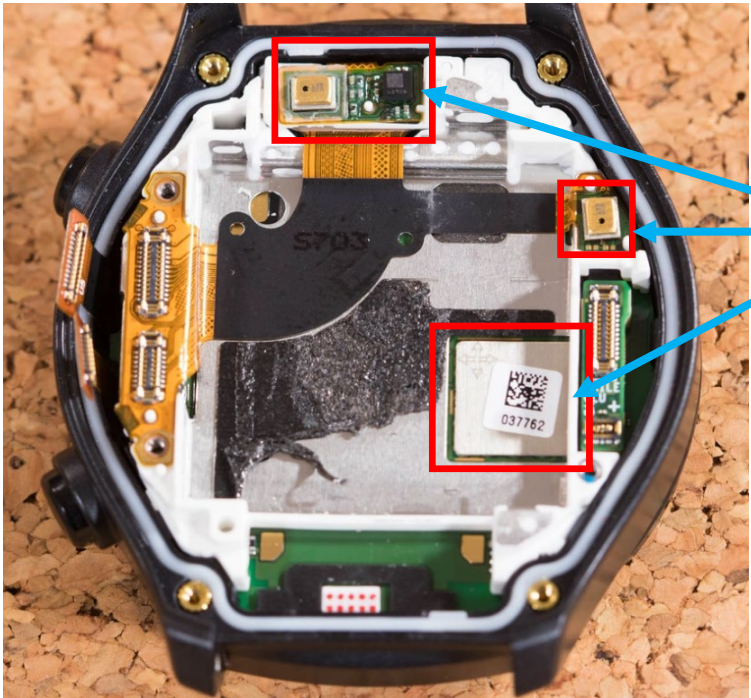# US 6,059,576 C1 vs. HUAWEI

Claim (1)	Huawei Watch 2
a power source;	**1.2 Charging your watch** **Charging** Your watch comes with a magnetic charging cradle and a USB cable, which can be used with a standard charger (5 V/1 A) to charge your watch. 2. When your watch is fully charged, **100%** will be displayed on the watch screen. Remove your watch from the charging cradle. 08:08 100% ← a power source Source: Huawei Watch 2 User Guide, 2019, p2, see https://consumer.huawei.com/us/support/wearables/watch2/ a power source → **Battery** 420mAh (typical value) giving about 2 days typical use; Training mode (GPS & real-time heart rate monitoring on) about 10 hours Source: https://www.t3.com/us/reviews/huawei-watch-2

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Claim (1)	Huawei Watch 2
a microprocessor connected to said movement sensor and to said power source, said microprocessor capable of receiving, interpreting, storing and responding to said movement data based on user-defined operational parameters,	**Software and hardware** The Watch 2 runs on Android Wear 2.0. We covered that in a separate story . Manufacturers are not allowed to adjust much to Wear 2.0 and Huawei has therefore not been able to do that. It has its own apps, of course, such as Huawei's fitness app and its own watch faces, but that's it. The watch has a Snapdragon Wear 2100-soc, a chip designed for wearables from Qualcomm. It has four Cortex A7 processor cores at 1.2GHz and an Adreno 304 GPU, combined with 786MB of lpddr3 memory. Qualcomm has the Wear 2100 made on a 28nm process. a microprocessor connected to a microprocessor connected to said power source, Source: https://tweakers.net/reviews/5399/huawei-watch-2-tussen-sport-en-stijl.html

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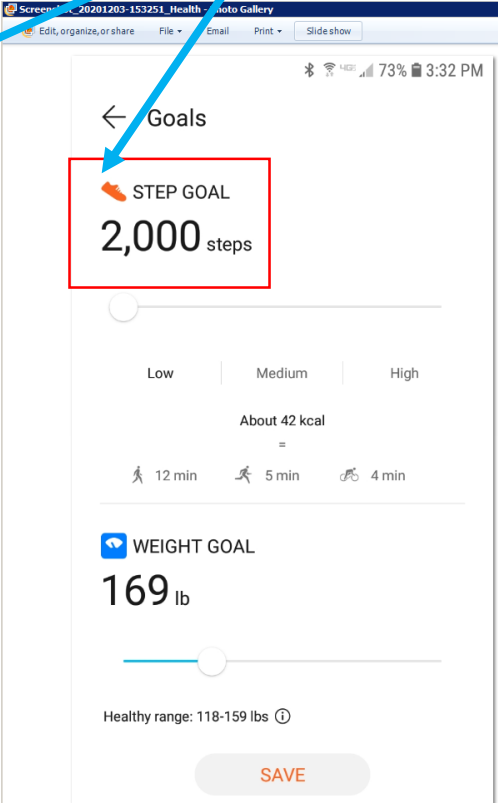| Claim (1)	Huawei Watch 2
a microprocessor connected to said movement sensor and to said power source, said microprocessor capable of receiving, interpreting, storing and responding to said movement data based on user-defined operational parameters,	a microprocessor connected to said movement sensor, The vibration motor, together with the heart rate sensor, is on the back. Inside, the display connectors are also visible on the left, a pair of sensors on the top, and the recess for the vibrator motor and below that Source: https://tweakers.net/reviews/5399/huawei-watch-2-tussen-sport-en-stijl.html
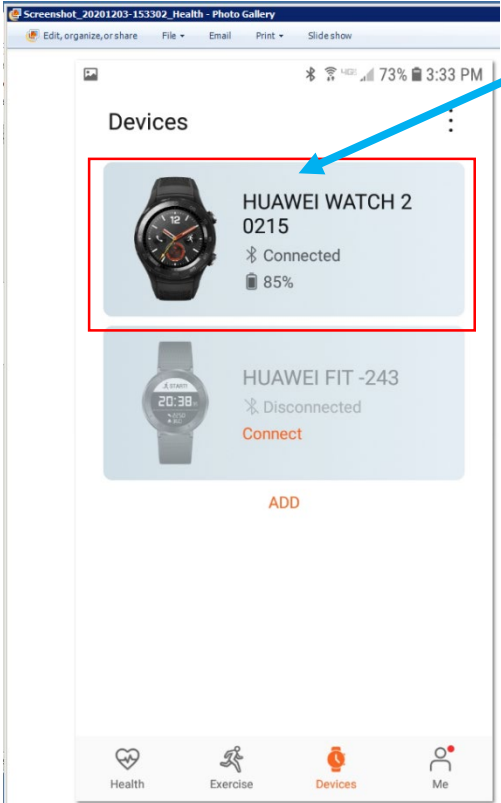
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Claim (1)	Huawei Watch 2
a microprocessor connected to said movement sensor and to said power source, said microprocessor capable of receiving, interpreting, storing and responding to said movement data based on user-defined operational parameters,	**HUAWEI WATCH 2 FULL SPEC** **Display:** 1.2-inch AMOLED, 390x390, 326ppi, Corning Gorilla Glass **Processor:** Qualcomm MSM8909W, 1.1 GHz ← a microprocessor connected to **Storage:** 4GB **Memory:** 768MB RAM **Cellular option:** LTE **Sensors:** Accelerometer, Gyroscope, Barometer, Heart rate sensor(PPG), CAP capacitance sensor, ALS/ambient light sensor, geomagnetic Sensor **Battery** 420mAh (typical value) giving about 2 days typical use; Training mode (GPS & real-time heart rate monitoring on) about 10 hours ← a microprocessor connected to said power source, keep you there. Presumably by shouting things like, "Speed up fatso, or nobody will love you." The same virtual instructor will also warn you if you're going too hard, and give regular updates on pace and distance. ← a microprocessor connected to said movement sensor, Source: https://www.t3.com/us/reviews/huawei-watch-2

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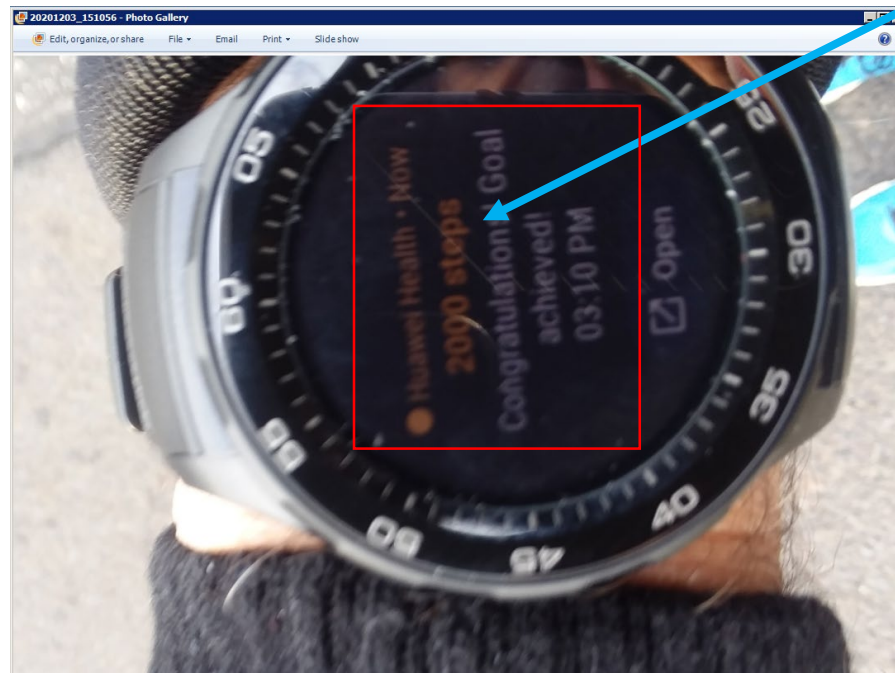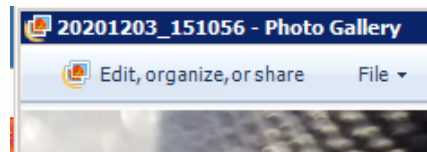| Claim (1)	Huawei Watch 2
a microprocessor connected to said movement sensor and to said power source, said microprocessor capable of receiving, interpreting, storing and responding to said movement data based on user-defined operational parameters,	said microprocessor capable of receiving, interpreting, storing said movement data **6.1 Monitoring your fitness** Wear your watch and it will automatically record your fitness data all day. Your watch can automatically identify your status, such as walking, running, climbing, and standing. **Setting a workout target** Press the power button, and choose **Daily tracking**. If you are using this feature for the first time, swipe left on the screen to enter your personnel information such as gender, age, weight, and height. You can then set your workout target in **Daily goal**. based on user-defined operational parameters **Checking sports data on your watch** Press the power button on the home screen, and choose **Daily tracking**. Swipe up on the screen to view sports data, such as walking and running distance, steps, calories burnt, flights climbed, workout duration, and standing data. said microprocessor capable of storing said movement data Source: Huawei Watch 2 User Guide, 2019, p29, see https://consumer.huawei.com/us/support/wearables/watch2/

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Claim (1)	Huawei Watch 2
a microprocessor connected to said movement sensor and to said power source, said microprocessor capable of receiving, interpreting, storing and responding to said movement data based on user-defined operational parameters,	based on user-defined operational parameters Comment: Screenshot of the goals set for the Huawei Watch

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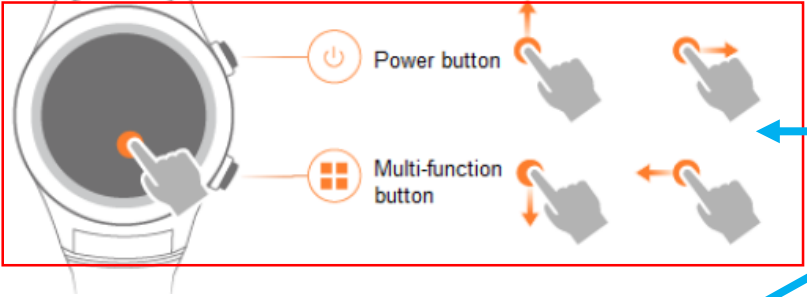| Claim (1)	Huawei Watch 2
detecting a first user-defined event based on the movement data and at least one of the user-defined operational parameters regarding the movement data,	*detecting a first user-defined event based on the movement data and at least one of the user-defined operational parameters regarding the movement data* Comment: Photo of the Huawei Watch 2 goal notification (20201203_151056).

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Claim (1)	Huawei Watch 2
and storing first event information related to the detected first user-defined event along with first time stamp information reflecting a time at which the movement data causing the first user-defined event occurred;	*storing first event information* **Huawei TCX Converter** A makeshift python tool that generates TCX files from Huawei HiTrack files. This project is now archived. It has been succedded by Hitrava which performs the same job but better. Users of Huawei Watches/Bands sync their fitness data with the Huawei Health App. It is notoriously difficult to get the data out of this app, but through some cunning you can find `HiTrack` files which seem to contain some run data. This program allows you to take these files and generate `.TCX` files for use in your tracking app of choice (e.g. Strava). The outputted `.TCX` files will contain timestamped GPS, altitude, heart-rate, and cadence data where available. *the movement data* *along with first time stamp information* Source: https://awesomeopensource.com/project/aricooperdavis/Huawei-TCX-Converter

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Claim (1)	Huawei Watch 2
at least one user input connected to said microprocessor for controlling the operation of said device;	You can perform different operations using the side buttons and touch gestures. See the following for more details. **Power button** Press the power button: ● Turn on the screen. ● Access the app list screen. **Multi-function button** Press and hold the multi-function button to open the workout app when the screen is turned on. at least one user input connected to said microprocessor for controlling the operation of said device; Source: Huawei Watch 2 User Guide, 2019, pp 13-14, see https://consumer.huawei.com/us/support/wearables/watch2/

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Claim (1)	Huawei Watch 2
a real-time clock connected to said microprocessor;	**Checking sports data on your watch** Press the power button on the home screen, and choose 👟 **Daily tracking**. Swipe up on the screen to view sports data, such as walking and running distance, steps, calories burnt, flights climbed, workout duration, and standing data. ● Between 7:00 and 19:00, if you stand up or do exercise with medium or high intensity for over 1 minute, the motion is recorded as you standing up once. Standing up multiple times within 1 hour are recorded as standing up once. a real-time clock connected to said microprocessor **6.2 Monitoring your fitness time and calories** The 🏃 **Workout** app on your watch helps you record the fitness data for a single exercise session. Set your fitness time and calories target and start exercising. 📖NOTE Your watch will not record your fitness data if your workout time is less than 1 minute, or the walking and running distance is less than 100 meters. Source: Huawei Watch 2 User Guide, 2019, pp 29-31, see https://consumer.huawei.com/us/support/wearables/watch2/

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Claim (1)	Huawei Watch 2
memory for storing said movement data; and	**HUAWEI WATCH 2 FULL SPEC** **Display:** 1.2-inch AMOLED, 390x390, 326ppi, Corning Gorilla Glass **Processor:** Qualcomm MSM8909W, 1.1 GHz **Storage:** 4GB **Memory:** 768MB RAM ← memory for storing said movement data **Cellular option:** LTE **Sensors:** Accelerometer, Gyroscope, Barometer, Heart rate sensor(PPG), CAP capacitance sensor, ALS/ambient light sensor, geomagnetic Sensor **Battery** 420mAh (typical value) giving about 2 days typical use; Training mode (GPS & real-time heart rate monitoring on) about 10 hours Source: https://www.t3.com/us/reviews/huawei-watch-2 **6.1 Monitoring your fitness** Wear your watch and it will automatically record your fitness data all day. Your watch can automatically identify your status, such as walking, running, climbing, and standing. **Checking sports data on your watch** Press the power button on the home screen, and choose 🔘 **Daily tracking**. Swipe up on the screen to view sports data, such as walking and running distance, steps, calories burnt, flights climbed, workout duration, and standing data. ← memory for storing said movement data Source: Huawei Watch 2 User Guide, 2019, p29, see https://consumer.huawei.com/us/support/wearables/watch2/

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Claim (1)	Huawei Watch 2
an output indicator connected to said microprocessor for signaling the occurrence of user-defined events;	**Checking sports data on your watch** • Set **Notification** to **ON** in **Daily tracking**. Your watch will notify you once you reach 100% of your workout target. an output indicator connected to said microprocessor for signaling the occurrence of user-defined events Source: Huawei Watch 2 User Guide, 2019, pp 29-30, see https://consumer.huawei.com/us/support/wearables/watch2/

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Claim (1)	Huawei Watch 2
wherein said movement sensor measures the angle and velocity of said movement.	keep you there. Presumably by shouting things like, "Speed up fatso, or nobody will love you." The same virtual instructor will also warn you if you're going too hard, and give regular updates on pace and distance. *said movement sensor measures the angle and velocity of said movement.*

HUAWEI WATCH 2 FULL SPEC

Display: 1.2-inch AMOLED, 390x390, 326ppi, Corning Gorilla Glass

Processor: Qualcomm MSM8909W, 1.1 GHz

Storage: 4GB

Memory: 768MB RAM

Cellular option: LTE

Sensors: Accelerometer, Gyroscope, Barometer, Heart rate sensor(PPG), CAP capacitance sensor, ALS/ambient light sensor, geomagnetic Sensor

Source: https://www.t3.com/us/reviews/huawei-watch-2

said movement sensor measures the angle and velocity of said movement.

6.1 Monitoring your fitness

Wear your watch and it will automatically record your fitness data all day. Your watch can automatically identify your status, such as walking, running, climbing, and standing.

Source: Huawei Watch 2 User Guide, 2019, p29, see https://consumer.huawei.com/us/support/wearables/watch2/

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Claim (20)	Huawei Watch 2
A method to monitor physical movement of a body part comprising the steps of:	Wear your watch and it will automatically record your fitness data all day. Your watch can automatically identify your status, such as walking, running, climbing, and standing. Source: Huawei Watch 2 User Guide, 2019, p29, see https://consumer.huawei.com/us/support/wearables/watch2/ **Health and fitness** Your watch identifies and measures your daily movements intelligently and precisely. You can also enable the **Workout** Source: Huawei Watch 2 Quick Start Guide, 2019, p6, see https://consumer.huawei.com/us/support/wearables/watch2 A method to monitor physical movement of a body part .

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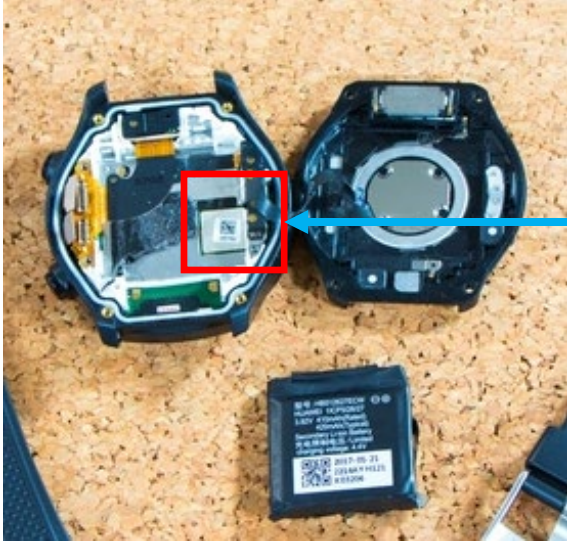| Claim (20)	Huawei Watch 2
attaching a portable, self-contained movement measuring device to said body part for measuring unrestrained movement in any direction;	attaching a portable, self-contained movement measuring device to said body part. Wear your watch and it will automatically record your fitness data all day. Your watch can automatically identify your status, such as walking, running, climbing, and standing. Source: Huawei Watch 2 User Guide, 2019, p29, see https://consumer.huawei.com/us/support/wearables/watch2/ for measuring unrestrained movement in any direction; **Health and fitness** Your watch identifies and measures your daily movements intelligently and precisely. You can also enable the **Workout** Source: Huawei Watch 2 Quick Start Guide, 2019, p6, see https://consumer.huawei.com/us/support/wearables/watch2

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Claim (20)	Huawei Watch 2
measuring data associated with said physical movement;	**Health and fitness** Your watch identifies and measures your daily movements intelligently and precisely. You can also enable the **Workout** Source: Huawei Watch 2 Quick Start Guide, 2019, p6, see https://consumer.huawei.com/us/support/wearables/watch2 measuring data associated with said physical movement;

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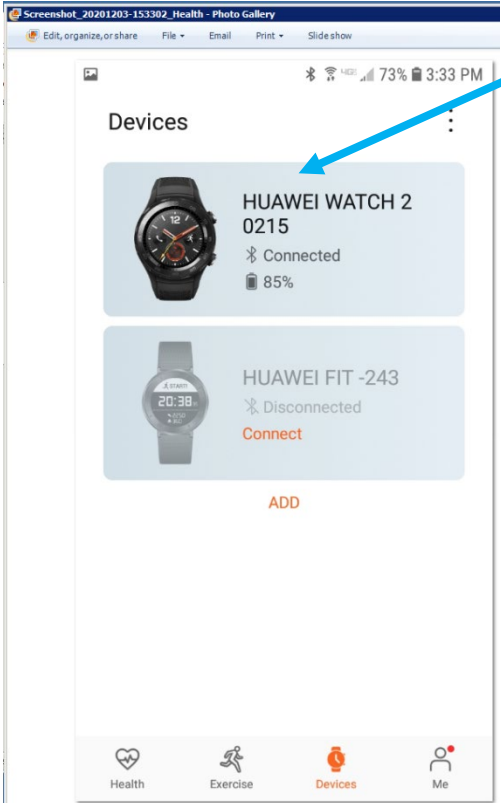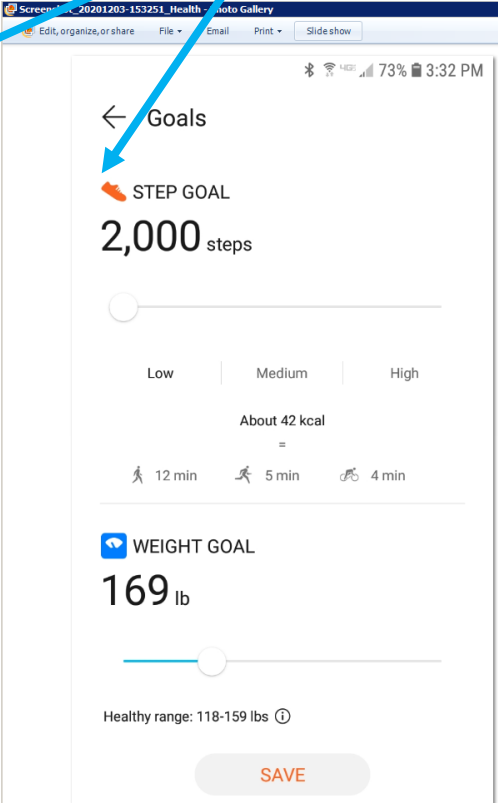| Claim (20)	Huawei Watch 2
interpreting, using a microprocessor included in the portable, self-contained movement measuring device, said physical movement data based on user-defined operational parameters and a real-time clock; [and]	**HUAWEI WATCH 2 FULL SPEC** **Display:** 1.2-inch AMOLED, 390x390, 326ppi, Corning Gorilla Glass **Processor:** Qualcomm MSM8909W, 1.1 GHz ← using a microprocessor included in the portable, self-contained movement measuring device, **Storage:** 4GB **Memory:** 768MB RAM **Cellular option:** LTE **Sensors:** Accelerometer, Gyroscope, Barometer, Heart rate sensor(PPG), CAP capacitance sensor, ALS/ambient light sensor, geomagnetic Sensor **Battery** 420mAh (typical value) giving about 2 days typical use; Training mode (GPS & real-time heart rate monitoring on) about 10 hours Source: https://www.t3.com/us/reviews/huawei-watch-2

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Claim (20)	Huawei Watch 2
interpreting, using a microprocessor included in the portable, self-contained movement measuring device, said physical movement data based on user-defined operational parameters and a real-time clock; [and]	**Software and hardware** The Watch 2 runs on Android Wear 2.0. We covered that in a separate story . Manufacturers are not allowed to adjust much to Wear 2.0 and Huawei has therefore not been able to do that. It has its own apps, of course, such as Huawei's fitness app and its own watch faces, but that's it. The watch has a Snapdragon Wear 2100-soc, a chip designed for wearables from Qualcomm. It has four Cortex A7 processor cores at 1.2GHz and an Adreno 304 GPU, combined with 786MB of lpddr3 memory. Qualcomm has the Wear 2100 made on a 28nm process. using a microprocessor included in the portable, self-contained movement measuring device, Source: https://tweakers.net/reviews/5399/huawei-watch-2-tussen-sport-en-stijl.html

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Claim (20)	Huawei Watch 2
interpreting, using a microprocessor included in the portable, self-contained movement measuring device, said physical movement data based on user-defined operational parameters and a real-time clock; [and]	**Health and fitness** Your watch identifies and measures your daily movements intelligently and precisely. You can also enable the Workout Source: Huawei Watch 2 Quick Start Guide, 2019, p6, see https://consumer.huawei.com/us/support/wearables/watch2 interpreting, using a microprocessor included in the portable, self-contained movement measuring device, said physical movement data **6.1 Monitoring your fitness** Wear your watch and it will automatically record your fitness data all day. Your watch can automatically identify your status, such as walking, running, climbing, and standing. **Checking sports data on your watch** Press the power button on the home screen, and choose **Daily Tracking**. Swipe up on the screen to view sports data, such as walking and running distance, steps, calories burnt, flights climbed, workout duration, and standing data. Source: Huawei Watch 2 User Guide, 2019, p29, see https://consumer.huawei.com/us/support/wearables/watch2/

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Claim (20)	Huawei Watch 2
interpreting, using a microprocessor included in the portable, self-contained movement measuring device, said physical movement data based on user-defined operational parameters and a real-time clock; [and]	based on user-defined operational parameters Comment: Screenshot of the goals set for the Huawei Watch

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Claim (20)	Huawei Watch 2
interpreting, using a microprocessor included in the portable, self-contained movement measuring device, said physical movement data based on user-defined operational parameters and a real-time clock; [and]	**Checking sports data on your watch** Press the power button on the home screen, and choose 👟 **Daily tracking**. Swipe up on the screen to view sports data, such as walking and running distance, steps, calories burnt, flights climbed, workout duration, and standing data. • Between 7:00 and 19:00, if you stand up or do exercise with medium or high intensity for over 1 minute, the motion is recorded as you standing up once. Standing up multiple times within 1 hour are recorded as standing up once. **6.2 Monitoring your fitness time and calories** The 🏃 **Workout** app on your watch helps you record the fitness data for a single exercise session. Set your fitness time and calories target and start exercising. 📖 NOTE Your watch will not record your fitness data if your workout time is less than 1 minute, or the walking and running distance is less than 100 meters. Source: Huawei Watch 2 User Guide, 2019, pp 29-31, see https://consumer.huawei.com/us/support/wearables/watch2/

and a real-time clock; [and]

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Claim (20)	Huawei Watch 2
storing said data in memory;	**HUAWEI WATCH 2 FULL SPEC** **Display:** 1.2-inch AMOLED, 390x390, 326ppi, Corning Gorilla Glass **Processor:** Qualcomm MSM8909W, 1.1 GHz **Storage:** 4GB **Memory:** 768MB RAM ← storing said data in memory; **Cellular option:** LTE **Sensors:** Accelerometer, Gyroscope, Barometer, Heart rate sensor(PPG), CAP capacitance sensor, ALS/ambient light sensor, geomagnetic Sensor **Battery** 420mAh (typical value) giving about 2 days typical use; Training mode (GPS & real-time heart rate monitoring on) about 10 hours Source: https://www.t3.com/us/reviews/huawei-watch-2 **6.1 Monitoring your fitness** storing said data in memory; Wear your watch and it will automatically record your fitness data all day. Your watch can automatically identify your status, such as walking, running, climbing, and standing. **Checking sports data on your watch** Press the power button on the home screen, and choose 🔘 **Daily tracking**. Swipe up on the screen to view sports data, such as walking and running distance, steps, calories burnt, flights climbed, workout duration, and standing data. Source: Huawei Watch 2 User Guide, 2019, p29, see https://consumer.huawei.com/us/support/wearables/watch2/

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Claim (20)	Huawei Watch 2
detecting, using the microprocessor, a first user-defined event based on the movement data and at least one of the user-defined operational parameters regarding the movement data; and	detecting, using the microprocessor, a first user-defined event based on the movement data and at least one of the user-defined operational parameters regarding the movement data; and Comment: Photo of the Huawei Watch 2 goal notification (20201203_151056).

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Claim (20)	Huawei Watch 2
storing, in said memory, first event information related to the detected first user-defined event along with first time stamp information reflecting a time at which the movement data causing the first user-defined event occurred.	storing, in said memory, first event information. the movement data along with first time stamp information Source: https://awesomeopensource.com/project/aricooperdavis/Huawei-TCX-Converter